THE INVENTION CLAIMED IS

1. A doping process, consisting of:

depositing dopant on a surface of a material to be doped; and

incorporating the dopant into the material by pulsed energy processing.

2. The process of Claim 1, wherein depositing the dopant is carried out by a technique selected from the group consisting of plasma enhanced chemical vapor deposition, sputtering, condensation through cooling the material to be doped, thermal decomposition CVD, and photolytic decomposition.

3. The process of Claim 1, wherein depositing the dopant is carried out using a dopant atmospheric selected from the group consisting of BF_3, PF_5, AsH_3, B_2H_6, PH_3, AsF_5, and organometallics.

4. The process of Claim 1, wherein the pulsed energy processing is carried out using pulsed energy selected from the group consisting of pulsed laser energy and pulsed ion-beam energy.

5. The process of Claim 4, wherein the pulsed laser energy is provided by a laser selected from the group consisting of excimer lasers, copper vapor lasers, dye lasers, and pulsed NdYAG lasers.

6. The process of Claim 5, wherein the pulsed laser energy is produced by an XeCl excimer laser.

7. The process of Claim 6, wherein the pulsed excimer laser is constructed to operate at a wavelength of 308 nm, and controlling the excimer laser to produce 1 to about 10 pulses with an energy pulse of 50 to 1000 mj cm^{-2}, and with a pulse length of 5 to 100 ns.

8. The process of Claim 1, wherein the dopant depositing and the pulsed energy processing is carried out so as to produce a dose of 10^{14} to 10^{15} electrically active dopant atoms per energy pulse.

9. An improved semiconductor doping process, comprising:

depositing a layer of dopant atoms/molecules on a surface of a semiconductor, followed by exposure to one or more energy pulses which melts a portion of the semiconductor, forming a molten region thereby causing the dopant atoms/molecules to be incorporated into the molten region; and

allowing the molten region to recrystallize whereby the dopant atoms/molecules are electrically active in the semiconductor.

10. The process of Claim 9, wherein depositing the layer of dopant atoms/molecules is carried out by a technique selected from the group consisting of PECVD, glow discharge CVD, sputtering, condensation, photolytic decomposition, and thermal decomposition CVD.

11. The process of Claim 10, wherein the depositing of the layer of dopant atoms/molecules is carried out in an atmosphere selected from the group consisting of BF_3, PF_5, AsH_3, B_2H_6, AsF_5, PH_3, and organometallics.

12. The process of Claim 9, additionally including forming the one or more energy pulses using ~~a pulsed ion beam machine or~~ a pulsed laser selected from the group consisting of excimer lasers, copper vapor lasers, dye lasers, and pulsed NdYAG lasers.

13. The process of Claim 9, wherein the one or more energy pulses is supplied with a wavelength such that the energy is absorbed in the near surface region of the semiconductor.

14. The process of Claim 9, wherein the one or more energy pulses have a pulse duration of less than 1 ms.

15. The process of Claim 9, wherein the one or more energy pulses are produced by an XeCl excimer laser.

16. The process of Claim 9, additionally including forming the semiconductor from at least a layer of silicon.

17. The process of Claim 16, wherein the molten region recrystallizes as doped polysilicon.

18. In a process for doping a semiconductor material using pulsed laser energy or pulsed ion beam energy processing, the improvement comprising:

forming a layer of dopant atoms on a surface of the semiconductor material prior to pulsed energy processing.

19. The improvement of Claim 18, additionally including forming the dopant atoms from a material which is electrically active following the pulsed energy processing, and wherein forming of the layer of dopant atoms is carried out such that a dose of electrically active dopant atoms formed from a layer of dopant atoms per energy pulse is greater than a dose of dopant atoms formed by pulsed energy processing in the presence of a dopant atmosphere.

20. The improvement of Claim 18, wherein the pulsed energy processing is carried out using one or more pulses from an excimer laser or an ion beam machine.